

SUMMATIVE ASSESSMENT-I, 2012

Class-X

Subject-Mathematics

Time Allowed : 3 Hrs.

M.M. : 90

Please Check the Total Marks

General Instructions :

- (i) All questions are compulsory.
- (ii) The question paper consists of 34 questions divided into four sections A, B, C and D. Section-A comprises of 8 questions of 1 mark each; Section-B comprises of 6 question of 2 marks each; Section-C comprises of 10 questions of 3 marks each and Section-D comprises of 10 questions of 4 marks each.
- (iii) Question numbers 1 to 8 in Section-A are multiple choice questions where you are required to select one correct option out of the given four.
- (iv) There is no overall choice. However, internal choices have been provided in 1 question of two marks, 3 questions of three marks each and 2 questions of four marks each. You have to attempt only one of the alternatives in all such questions.
- (v) Use of calculator is not permitted.

Section-A

Question numbers 1 to 8 carry one mark each. For each question, four alternative choices have been provided of which only one is correct. You have to select the correct choice.

1. $\frac{3}{8}$ in decimal form is :

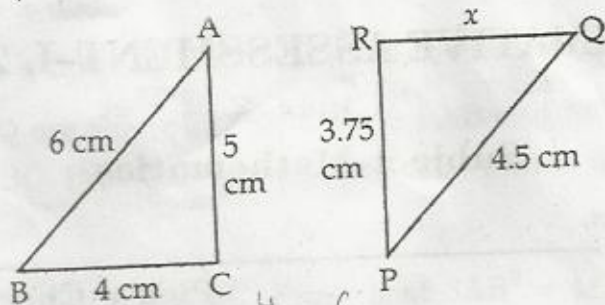
- (A) 0.125 (B) 0.0125 (C) 0.0375 (D) 0.375

2. The zeroes of the polynomial $p(x) = 4x^2 - 12x + 9$ are :

- (A) $\frac{3}{2}, \frac{3}{2}$ (B) $-\frac{3}{2}, -\frac{3}{2}$ (C) 3, 4 (D) -3, -4

$4x^2 - 12x + 9$
 $2x(2x - 3) - 3(2x - 3)$
 $(2x - 3)(2x - 3)$

3. In the given figure if $\Delta ABC \sim \Delta PQR$



$$\frac{4}{x} = \frac{6}{4.5}$$

The value of x is :

(A) 2.5 cm

(B) 3.5 cm

(C) 2.75 cm

(D) 3 cm

$$1b = 6a$$

4. If $x = a \cos \theta$, $y = b \sin \theta$, then $b^2 x^2 + a^2 y^2 - a^2 b^2$ is equal to :

(A) 1

(B) -1

(C) 0

(D) $2ab$

5. A rational number which has non-terminating decimal representation is :

(A) $\frac{111}{125}$

(B) $\frac{127}{8}$

(C) $\frac{19}{5^3 \times 2^2}$

(D) $\frac{9}{455}$

6. If $x = a$, $y = b$ is the solution of the pair of equation $x - y = 2$ and $x + y = 4$, then the respective values of a and b are :

(A) 3, 5

(B) 5, 3

(C) 3, 1

(D) -1, -3

7. The value of $\sin^2 60^\circ - \sin^2 30^\circ$ is :

(A) $\frac{1}{4}$

(B) $\frac{1}{2}$

(C) $\frac{3}{4}$

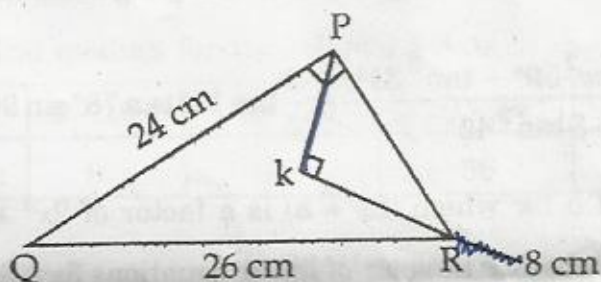
(D) $-\frac{1}{2}$

8. The class mark of the class 10 - 25 is :
- (A) 17 (B) 18
 (C) 17.5 (D) 15

Section-B

Question numbers 9 to 14 carry two marks each.

9. Find the HCF of 255 and 867 by Euclid division algorithm.
10. If p, q are zeroes of polynomial $f(x) = 2x^2 - 7x + 3$, find the value of $p^2 + q^2$.
11. In the given triangle PQR, $\angle QPR = 90^\circ$, $PQ = 24$ cm and $QR = 26$ cm and in ΔPKR , $\angle PKR = 90^\circ$ and $KR = 8$ cm find PK.



12. If $\sin A = \frac{\sqrt{3}}{2}$, find the value of $2\cot^2 A - 1$.
13. Find the quadratic polynomial whose zeroes are $\sqrt{2}$ and $2\sqrt{2}$.
14. Find the mean of the following frequency distribution :

Class :	0 - 6	6 - 12	12 - 18	18 - 24	24 - 30
Frequency :	7	5	10	12	6

Or

Find the mode of the following frequency distributions :

Class :	0 - 6	6 - 12	12 - 18	18 - 24	24 - 30
Frequency :	7	5	10	12	6

Section-C

Question numbers 15 to 24 carry three marks each.

15. Prove that the sum of squares on the sides of rhombus is equal to sum of squares on its diagonals.

16. Show that $\frac{1}{2}$ and $\frac{-3}{2}$ are the zeroes of the polynomial $4x^2 + 4x - 3$ and verify the relationship between zeroes and co-efficients of polynomial.

17. Express the number $0.3\overline{178}$ in the form of rational number $\frac{a}{b}$.

18. Find the value of the following without using trigonometric tables :

$$\frac{\cos 50^\circ}{2\sin 40^\circ} + \frac{4(\cos^2 59^\circ - \tan^2 31^\circ)}{3\tan^2 45^\circ} - \frac{2}{3}\tan 12^\circ \tan 78^\circ \sin 90^\circ$$

19. Find the value of b for which $(2x + 3)$ is a factor of $2x^3 + 9x^2 - x - b$.

20. Using graph, find whether the pair of linear equations $3x - 5y = 20$, $6x - 10y + 40 = 0$ is consistent or inconsistent. Write its solution.

Or

Solve for x and y :

$$\frac{6}{x-1} - \frac{3}{y-2} = 1$$

$$\frac{5}{x-1} + \frac{1}{y-2} = 2, \text{ where } x \neq 1, y \neq 2$$

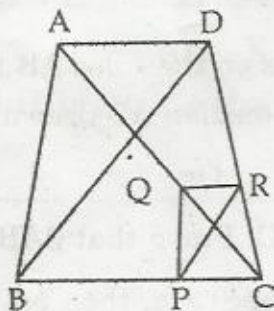
21. If the mean of the following distribution is 27, find the value of p :

Class :	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50
Frequency :	8	p	12	13	10

22. If the areas of two similar triangles are equal, then prove that they are congruent.

Or

In the given figure, two triangles ABC and DBC lie on same side of BC such that $PQ \parallel BA$ and $PR \parallel BD$. Prove that $QR \parallel AD$.



23. If $\sin 3\theta = \cos(\theta - 6^\circ)$, where 3θ and $\theta - 6^\circ$ are both acute angles, find the value of θ .

24. Find mean, and median for the following data :

Class :	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50
Frequency :	8	16	36	34	6

Section-D

Question numbers 25 to 34 carry four marks each.

25. By Euclid division algorithm, show that square of any positive integer is of the form $3n$ or $3n + 1$.

26. For what value of k will the pair of equations have no solution ?

$$3x + y = 1$$

$$(2k - 1)x + (k - 1)y = 2k + 1$$

27. Prove that $(\sec A - \tan A)^2 (1 + \sin A) = 1 - \sin A$

28. Convert the following distribution into a "less than type" cumulative frequency distribution and draw its ogive, Also find the median from the ogive.

Class :	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60
Frequency :	7	10	23	51	6	3

29. What must be subtracted or added to $p(x) = 8x^4 + 14x^3 - 2x^2 + 8x - 12$ so that $4x^2 + 3x - 2$ is a factor of $p(x)$?

Or

Solve for x and y

$$133x + 87y = 353$$

$$\text{and } 87x + 133y = 307$$

30. In $\triangle ABC$, P and Q are the points on the sides AB and AC respectively such that PQ is parallel to BC . Prove that median AD drawn from A to BC bisects PQ also.

Or

31. In an equilateral $\triangle ABC$, $AD \perp BC$. Prove that $3AB^2 = 4AD^2$.

31. If $\sin\theta + \cos\theta = m$ and $\sec\theta + \operatorname{cosec}\theta = n$, then prove that $n(m^2 - 1) = 2m$.

32. Prove that the ratio of the areas of two similar triangles is equal to the ratio of the squares on their corresponding sides.

33. Prove that : $\frac{\cos\theta}{1-\tan\theta} + \frac{\sin\theta}{1-\cot\theta} = (\cos\theta + \sin\theta)$

34. Find the value of f_1 from the following data if its mode is 65 :

Class :	0 - 20	20 - 40	40 - 60	60 - 80	80 - 100	100 - 120
Frequency :	6	8	f_1	12	6	5

Where frequency 6, 8, f_1 and 12 are in ascending order.